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-- 51. (New) The information-carrying polymer of claim 9 comprising part of a random number generator. --

A4  
-- 52. (New) The information-carrying polymers of claim 9, wherein the polymers are used to label individual nucleic acids. --

-- 53. (New) The information-carrying polymers of claim 9, wherein the polymers are used to label genes. --

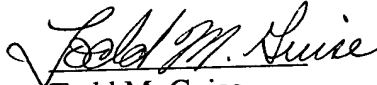
#### REMARKS

Entrance of this Amendment is respectfully requested. Attached hereto is a marked version of the changes made to the specification and claims by the current Amendment. The pages captioned "MARKED-UP VERSION OF AMENDMENTS" include marking to show the changes made to the claims by the current Amendment.

#### *Status of Claims (Amendments)*

Applicants have cancelled claim 43, amended claims 1-38, 40-42, and 45, and added new claims 48-53. Claims 1-42 and 43-53 are pending in this application with claims 1, 9, 10, 39, 40, 42, 44, 46, and 47 being the only independent claims. Examination and consideration of the claims are respectfully requested.

Respectfully submitted,

  
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# **MARKED-UP VERSION OF AMENDMENTS**

## **IN THE CLAIMS:**

Claim 1 was amended as follows:

1. (Amended) A method for producing information-carrying polymers, comprising:

Step I: defining a regular grammar  $G = (\Sigma, V, R, S)$  with a finite terminal alphabet  $\Sigma$ , a finite set of variables  $V$ , a finite set of rules  $R$ , and a start symbol  $S$ ;

Step II: being the NFR method (Niehaus-Feldkamp-Rauhe method) for producing monomer sequences;

Step III: implementing, with the NFR method, a grammar as defined in Step I, by producing with the NFR method monomer sequences that unambiguously represent the said set of rules  $R$  of a grammar  $G$ ;

Step IV: assembling, from the said monomer sequences manufactured in Step III, for each rule of the said set of rules  $R$  of  $G$  an oligomer representing that rule;

Step V: linking the said oligomers assembled in Step IV to information-carrying polymers coding words of said regular grammar  $G$ .

Claim 2 was amended as follows:

2. (Amended) The method ~~Method~~ according to claim 1, ~~characterized in that~~ the wherein said terminal alphabet  $\Sigma$  of a grammar  $G$  contains terminals 0 and 1,  $n$  start terminals  $s$  ( $s_0, s_1, \dots, s_n$ ) and  $m$  end terminals  $e$  ( $e_0, e_1, \dots, e_m$ ), wherein  $n$  and  $m$  are integers larger than or equal to 0.

Claim 3 was amended as follows:

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3. (Amended) The method Method according to claim 1 ~~or 2~~, wherein said ~~characterized in that the~~ monomer sequence constructed in Step III includes nucleotides, ~~in particular ribonucleotides, most preferably deoxyribonucleotides.~~

Claim 4 was amended as follows:

4. (Amended) The method Method according to claim 3, wherein said ~~characterized in that the~~ monomer sequence constructed in Step III includes protein recognition sequences ~~(such as restriction cut sites, protein binding sites or stop codons).~~

Claim 5 was amended as follows:

5. (Amended) The method Method according to ~~any of the preceding claims~~ claim 1, wherein said ~~characterized in that the~~ synthesis of the said monomer sequences in Step II and III is carried out in vitro, ~~preferably with an oligonucleotide synthesizer.~~

Claim 6 was amended as follows:

6. (Amended) The method Method according to claim 1, wherein said ~~for isolating and amplifying information-carrying polymers that have been obtained in accordance with any of the preceding claims, characterized in that the~~ information-carrying polymers obtained in Step V are ligated into cloning vectors;<sub>1</sub>  
competent cells are transformed with these vectors;<sub>2</sub> and  
the ~~successfully~~ transformed bacteria cells are selected according to selection markers.

Claim 7 was amended as follows:

7. (Amended) The method Method ~~for reading information from information-carrying polymers that have been obtained or isolated and amplified in accordance with any of the preceding claims, characterized in that~~ according to claim 1, further comprising  
a) obtaining one pair of anti-sense primers, each of said primers is mixed into at least n-1 solutions containing the said information-carrying polymer,

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- wherein n is the number of oligomers contained as elongators in ~~the~~ said polymer;
- b) carrying out at least n-1 PCR approaches, wherein n is the number of oligomers contained as elongators in ~~the~~ said polymer, and one primer of each pair primes in the terminator opposite to the elongator and the other primer primes in the elongator itself;
  - c) obtaining polymer fragments ~~obtained~~ by PCR, wherein said polymer fragments are separated by length using electrophoresis; and
  - d) the optically reading out a pattern obtained by electrophoresis ~~is read out~~ optically.

Claim 8 was amended as follows:

8. (Amended) The method ~~Method~~ according to claim 7, ~~characterized in that~~ the wherein said reading out of said pattern in Step d) is performed automatically with a scanner or a sequencing machine.

Claim 9 was amended as follows:

9. (Amended) Information-carrying polymers ~~polymer obtained in accordance with one of the claims 1 to 6 produced by the steps comprising:~~  
defining a regular grammar  $G = (\Sigma, V, R, S)$  with a finite terminal alphabet  $\Sigma$ ,  
a finite set of variables V, a finite set of rules R, and a start symbol S;  
being the NFR method (Niehaus-Feldkamp-Rauhe method) for producing  
monomer sequences;  
implementing, with the NFR method, a grammar as previously defined, by  
producing with the NFR method monomer sequences that unambiguously  
represent the said set of rules R of a grammar G;  
assembling, from said monomer sequences manufactured as defined, for each  
rule of said set of rules R of G an oligomer representing that rule;  
linking said oligomers assembled in Step IV to information-carrying polymers  
coding words of said regular grammar G.

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Claim 10 was amended as follows:

10. (Amended) A random ~~Random~~ number generator comprising information-carrying polymers, ~~in particular polymers in accordance with claim 9.~~

Claim 11 was amended as follows:

11. (Amended) ~~Polymeric data storage comprising~~ The information-carrying polymers in accordance with ~~of~~ claim 9, wherein the polymers comprise part of a polymeric data storage.

Claim 12 was amended as follows:

12. (Amended) ~~DNA computer comprising~~ The information-carrying polymers in accordance with ~~of~~ claim 9, wherein the polymers comprise part of a DNA computer.

Claim 13 was amended as follows:

13. (Amended) ~~Biochip comprising~~ The information-carrying polymers in accordance with ~~of~~ claim 9, wherein the polymers comprise part of a biochip.

Claim 14 was amended as follows:

14. (Amended) ~~Use of~~ The information-carrying polymers in accordance with ~~of~~ claim 9, wherein the polymers are used to manufacture molecular weight standards.

Claim 15 was amended as follows:

15. (Amended) ~~Use of~~ The information-carrying polymers in accordance with ~~of~~ claim 9, wherein the polymers are used to represent data structures.

Claim 16 was amended as follows:

16. (Amended) ~~Use of~~ The information-carrying polymers, in particular of polymers in accordance with ~~of~~ claim 9, wherein the polymers are used as markers or signatures.

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Claim 17 was amended as follows:

17. (Amended) ~~Use of The information-carrying polymers, in particular of~~  
~~polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of  
quality assurance.

Claim 18 was amended as follows:

18. (Amended) ~~Use of The information-carrying polymers, in particular of~~  
~~polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of  
forgery protection.

Claim 19 was amended as follows:

19. (Amended) ~~Use of The information-carrying polymers, in particular of~~  
~~polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of  
labeling genetically engineered products.

Claim 20 was amended as follows:

20. (Amended) ~~Use of The information-carrying polymers, in particular of~~  
~~polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of  
labeling food.

Claim 21 was amended as follows:

21. (Amended) ~~Use of The information-carrying polymers, in particular of~~  
~~polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of  
labeling organisms.

Claim 22 was amended as follows:

22. (Amended) ~~Use of The information-carrying polymers, in particular of~~  
~~polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of  
labeling chemical products.

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Claim 23 was amended as follows:

23. (Amended) ~~Use of The information-carrying polymers, in particular of polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of labeling medical and pharmaceutical products.

Claim 24 was amended as follows:

24. (Amended) ~~Use of The information-carrying polymers, in particular of polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of labeling documents.

Claim 25 was amended as follows:

25. (Amended) ~~Use of The information-carrying polymers, in particular of polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of labeling money.

Claim 26 was amended as follows:

26. (Amended) ~~Use of The information-carrying polymers, in particular of polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of labeling objects and machinery.

Claim 27 was amended as follows:

27. (Amended) ~~Use of The information-carrying polymers, in particular of polymers in accordance with~~ of claim 9, wherein the polymers are used for the purpose of labeling liquids, solutions, suspensions, or emulsions.

Claim 28 was amended as follows:

28. (Amended) ~~Use of The information-carrying polymers, in particular of polymers in accordance with~~ of claim 9, wherein the polymers are used to encrypt information.

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Claim 29 was amended as follows:

29. (Amended) ~~Use of The~~ information-carrying polymers, ~~in particular of~~ polymers in accordance with of claim 9, wherein the polymers are used for the purpose of authenticating persons and objects.

Claim 30 was amended as follows:

30. (Amended) ~~Use of The~~ information-carrying polymers, ~~in particular of~~ polymers in accordance with of claim 9, wherein the polymers are used as molecular-scale adhesives.

Claim 31 was amended as follows:

31. (Amended) ~~Use of The~~ information-carrying polymers ~~in accordance with~~ of claim 9, wherein the polymers are used to manufacture or process ~~smallest~~ molecular structures.

Claim 32 was amended as follows:

32. (Amended) ~~Use of The~~ information-carrying polymers ~~in accordance with~~ of claim 9, wherein the polymers are used for quality control of synthetically produced oligonucleotides.

Claim 33 was amended as follows:

33. (Amended) ~~Use of The~~ information-carrying polymers ~~in accordance with~~ of claim 9, wherein the polymers are used to manufacture biochips.

Claim 34 was amended as follows:

34. (Amended) ~~1 to n byte nucleic acids, in particular~~ The method according to claim 1, wherein 1- to n-byte nucleic acids are obtained ~~by any of the claims 1 to 6.~~

Claim 35 was amended as follows:



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35. (Amended) ~~1 to n byte biochips, in particular~~ The method according to claim 1, wherein, 1- to n-byte biochips are obtained by any of the claims 1 to 6.

Claim 36 was amended as follows:

36. (Amended) The information-carrying polymers of claim 9, wherein the polymers comprise part of biochips, wherein said biochips are used for Use of biochips, in particular of biochips in accordance with any of the claims 13, 33 and 35, as a data storage.

Claim 37 was amended as follows:

37. (Amended) The information-carrying polymers of claim 9, wherein the polymers comprise part of biochips, wherein said biochips are used Use of biochips, in particular of biochips in accordance with any of the claims 13, 33 and 35, to manufacture optical display devices or display screens.

Claim 38 was amended as follows:

38. (Amended) ~~Use of~~ The information-carrying polymers, in particular polymers in accordance with of claim 9, wherein the polymers are used to label individual molecules, in particular nucleic acids, most preferably of genes.

Claim 40 was amended as follows:

40. (Amended) Use of nucleic acids to encrypt information, wherein characterized in that for decryption, short nucleic acid sequences (primers) are used as the a key for decryption.

Claim 41 was amended as follows:

41. (Amended) ~~Use of~~ The information-carrying polymers, in particular polymers in accordance with of claim 9, wherein the polymers are used to encrypt information, characterized in that wherein the information-carrying polymer is concealed in a multitude of other polymers.

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Claim 42 was amended as follows:

42. (Amended) Use of polymers for the purpose of labeling, ~~characterized in that wherein~~ the polymers are encrypted.

Claim 43 was cancelled without prejudice.

Claim 45 was amended as follows:

45. (Amended) ~~Method for reading information from~~ The information-carrying polymers of claim 9, wherein the polymers are read using ~~obtained or isolated and amplified in accordance with any of the claims 1 to 6, characterized in that~~ biochips are used for the reading.

New claims 48-53 were added as follows:

-- 48. (New) The method according to claim 1, wherein said monomer sequence constructed in Step III includes ribonucleotides. --

-- 49. (New) The method according to claim 1, wherein said monomer sequence constructed in Step III includes deoxyribonucleotides. --

-- 50. (New) The method according to claim 4, wherein said protein recognition sequences are selected from the group consisting of restriction cut sites, protein binding sites, and stop codons. --

-- 51. (New) The information-carrying polymer of claim 9 comprising part of a random number generator. --

-- 52. (New) The information-carrying polymers of claim 9, wherein the polymers are used to label individual nucleic acids. --

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-- 53. (New) The information-carrying polymers of claim 9, wherein the polymers are used to label genes. --